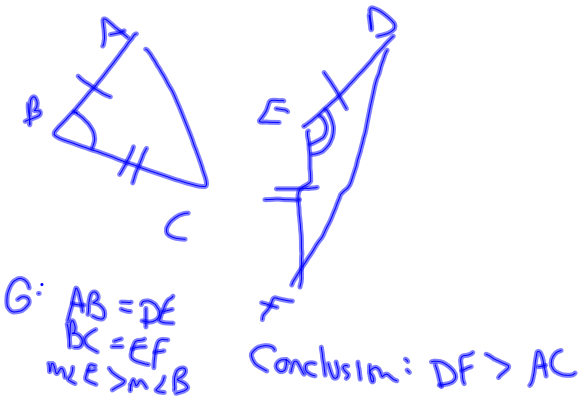
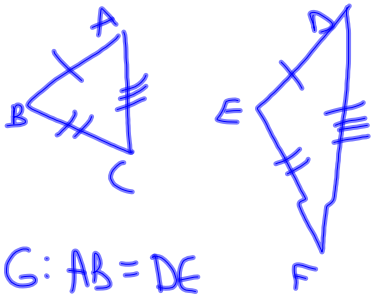
5.5 Inequalities Involving 2 Triangles

Theorem 5.13 SAS Inequality Theorem (Hinge Theorem)—If two sides of one triangle are congruent to two sides of another triangle, but the included angle of the first triangle is greater than the included angle of the second, then the third side of the first triangle is longer than the third side of the second triangle.



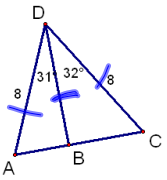
Theorem 5.14 SSS Inequality Theorem—If two sides of one triangle are congruent to two sides of another triangle, but the third side of the first triangle is longer than the third side of the second, then the included angle of the first triangle is larger than the included angle of the second triangle.



G: AB = DE
BC = EF
DF > AC

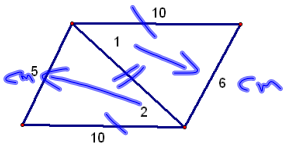
Conclusion:
$m\angle E > m\angle B$

Compare the listed sides or angles.



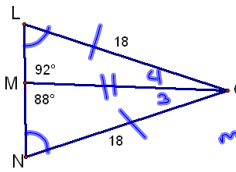
BC (>) AB

Compare the listed sides or angles.



$m\angle 1$ (>) $m\angle 2$

Compare the listed sides or angles.

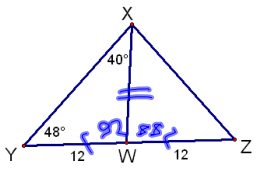


LM (<) MN

$m\angle 3 > m\angle 4$

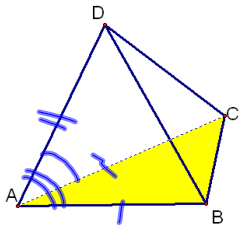
Challenging

Compare the listed sides or angles.



XZ < XY

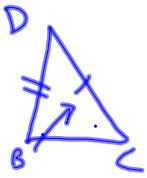
Compare the listed sides or angles.



AB = AC
m∠DAB > m∠DAC

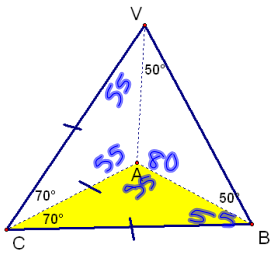
m∠DBC < m∠DCB

DB > DC



What is the longest segment?

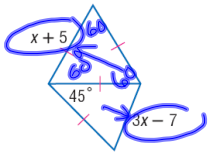
VB



△ABC AB > AC = BC
△VCA VA > AC = VC
△VBA VB > VA = AB

Write an inequality to describe the possible values of x.

5.



$3x - 7 > 0$
$x > 2\frac{1}{3}$
$x + 5 > 0$
$x > -5$

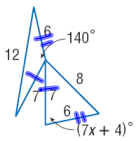
$x + 5 > 3x - 7$

$12 > 2x$
$6 > x$
$x < 6$

$2\frac{1}{3} < x < 6$

Write an inequality to describe the possible values of x.

6.



b/c $12 > 8$

$140 > 7x+4$

$136 > 7x$

$19.43 > x$

$-\frac{4}{7} < x < 19.43$

$7x+4 > 0$

$7x > -4$

$x > -\frac{4}{7}$

HW p271
10-18, 20